# The Nuisance Factor

At a traffic engineering conference recently one speaker said that "if all pedestrians were to wear reflectorized garters around their ankles at night, a good proportion of night pedestrian accidents would be prevented."

This reminds me of a well-meaning individual who once came to me with a scheme to prevent pedestrian accidents, both day and night. It seems that there were to be racks with reflectorized ping pong paddles ("Stop," painted on each paddle) on each street corner at heavily traveled intersections, and each pedestrian was to pick up a paddle, holding it aloft and toward traffic as he crossed the street. The paddles were to be replaced on the far corner rack.

Now these two schemes *if made to work* would probably eliminate some accidents, but it must be agreed that the ideas are not practical because of *the nuisance factor.*

Before any traffic control is put into effect, this potent quality, *the nuisance factor* must be taken into account.

The nuisance value of a device can be turned to advantage sometimes. Witness the use of pedestrian barriers or fences to discourage jaywalking.

If the nuisance value is high against a regulation, the chances are small of its being permanently successful or effective.

It's a nuisance to crane the neck to try to see the signal indication when improperly located—it's a nuisance to have to walk very far to cross the street in a cross-walk—it's a nuisance to wait at the curb for a long red phase of a too-long signal cycle.

These are only a few examples of common pedestrian nuisance factors. There are many more in connection with traffic regulation. Some of them, such as the nuisance of rolling down the window to hand signal, or such as parking properly, have to be overcome through enforcement and education. But traffic engineers can eliminate many others, thus assuring a maximum of public compliance with regulations.

Henry Barnes

*Editor*

# Centralization Requires Balanced Transportation Facilities

*by* GUY KELCEY, *Member I.T.E.**
*Consulting Engineer*

*Rockefeller Center* in New York and the *Merchandise Mart* in Chicago are illustrations which demonstrate that centralization has interesting benefits that can be realized if large groups of business enterprises concentrated on small land areas are served adequately by integrated facilities for horizontal and vertical transportation to accommodate mass as well as a reasonable proportion of private transport movements of people and cargoes. Problems involved yield to proper planning organization and management.

### Rockefeller Center, New York

The Rockefeller Center area in New York City is an excellent example of the benefits of carefully planned and balanced transportation facilities for the accommodation of enterprises and persons it serves.

The development was made in a three block blighted area of 12 acres that contained 229 antiquated stores, brown stone front buildings and prohibition period speak-easies. Construction cost alone was $59,500,000. Life expectancy of buildings was based on 40 to 50 years.

The 14 buildings that comprise this development are well separated, have spacious plazas and ground areas to provide light, air and view. Five million square feet of rentable floor space, or 12.6 times the ground area occupied is available.

Facilities, provided for the benefit of 30,000 regular tenants and an average of 125,000 visitors daily, include a two mile frontage of shops and services, three theatres, and other accommodations.

Rockefeller Center presents, essentially, a mass transportation problem. Its passenger transport needs are adequately met by four subway lines and a number of bus routes which serve the property. These facilities accommodate huge numbers of people smoothly and without disorder.

### Six-Floor Garage for Auto Parking

Off-street storage of inactive vehicles generated by this development is provided by an 800-car, modern, ramp type garage which occupies six floors, 3 below and 3 above ground, in one of the buildings. Short and long period garage rates offered are as low and in some cases lower than those offered by many other New York midtown garages and lower than some midtown, outdoor parking lots. In making this provision Rockefeller Center has *recognized its obligation* to store off-street the individual idle vehicles it generates or attracts.

* Mr. Kelcey is a member of the consulting firm of Edward and Kelcey, New York, associated with Deleuw, Cather and Company Engineers, Chicago.

**Elevator Capacity 4,000 Persons**

Two hundred elevators, some of them capable of high speeds of sixteen vertical miles per hour, in ten miles of elevator shaft, have a capacity of 4,000 persons at one time.

In all but two of the buildings, off-street loading facilities are provided underground, from 4:00 A.M. to 7:30 P.M., for some 750 trucks that carry a substantial daily tonnage in and out.

Provision for peak load, horizontal and vertical transportation was as carefully calculated as for water, waste, electricity and other services.

Some of the benefits that have resulted from careful integration and management of facilities to meet the transportation demands of Rockefeller Center are worth recording. The investment has yielded splendid returns to its owners, to its patrons and to the community. In 1929 this area yielded $461,000 in taxes. In the tax year of 1943-1944 the tax return multiplied over six times to $2,820,600.

Nine-tenths of the land occupied is rented from Columbia University, which, before the development, received $300,000 a year. The University now gets $3,300,000 a year rental from Mr. Rockefeller.

**Pattern for Future Development**

The foregoing facts permit a number of assumptions and conclusions. It seems reasonable that the same careful provision and planning for horizontal and vertical transportation that profits Mr. Rockefeller and a population of persons as great as that of Salt Lake City, all housed on 12 acres of land, would likewise benefit other property owners, and their tenants and visitors elsewhere in new and existing developments. Other projects would also gain values from the same attention to mass transportation, off-street loading vehicle storage and elevator capacity.

The Rockefeller development reversed a decentralization trend in a blighted area and while Manhattan, Pittsburgh and many other communities were losing population and value, and while the impression prevailed that this was natural and inevitable, a very large group of persons are better accommodated in a smaller space than ever before and substantial new values were created. New York collected over six times as much taxes as before and Columbia University got ten times as much rental.

**Merchandise Mart, Chicago**

Chicago's Merchandise Mart, the world's largest building and buying center, is in an advantageous location on the north edge of the Loop area. Occupied by tenants who offer kindred lines of merchandise, its many useful facilities and accommodations reduce distributing and other costs to manufacturers, distributors, importers and buyers who are its tenants and patrons.

Started in 1928, it was completed in the depression period of 1931 in a section already over-supplied with rentable building space. "In the face of disturbed economic, political and sociological conditions" it has enjoyed a steady, progressive growth.

The Mart, which cost over $30,000,000, covers two city blocks, with a ground area of more than 5 acres. The floor area, of 93 acres, is 18.5 times the ground area. Operating facilities utilize 25% of this space leaving a rentable floor area of nearly 3,000,000 square feet. The entire building is mechanically ventilated. It has one of the lowest fire rates. Its police force consisting of 26 men and force of 360 other persons for its maintenance and operation costs $100,000 monthly.

Over 5600 lines of household and other goods from 4000 factories sold

for $305,640,000 in 1940. Approximately 27,000 employees of its 800 tenants work in the building. A number of retail shops, many personal services, a bank, post office, drug stores, three restaurants with a daily capacity of 15,000, transportation ticket offices, broadcasting studios, an influential business club, and elaborate and extensive exhibit facilities make it unnecessary to leave the building to satisfy normal wants.

**Doesn't Borrow Curb Space**

Many factors account, of course, for this successful use of what was formerly an unpromising, blighted area. In no small measure is this due to transportation facilities for passengers and property, without which it would be quite impossible. The Mart does not borrow its neighbors' curb space nor does it congest the area it occupies with long lines of vehicles attempting, expensively, to serve it. Instead, the problem of horizontal access for all forms of conveyance, of vehicle storage and of movement were very carefully balanced with facilities for vertical transport and both are keyed to peak demands.

Twenty-five high speed elevators can accommodate a peak of 18,750 passengers per hour, or from 65,000 to 85,000 per day. Eleven large freight elevators have a capacity of 55 tons per trip. They serve, directly, off-street freight and express facilities provided within the building.

Railroad freight lines, which terminate at the freight elevators, run under the building. Siding capacity is 14 cars.

Off-street loading platforms, covering 102,000 square feet, accommodate 80 trucks at one time.

A Railroad Express Agency, handling 1300 in and out shipments a day, operates from within the premises.

The building is serviced by nearly 600 feet of dock space along the Chicago River, which flows beside it.

**Railroad Station in Mart**

An elevated railroad station in the building collects over four million fares yearly and gives passenger access to all of Chicago. Street car service is also available from two stops close to the main entrance. Subway service will be available later. An off-street cab stand at the main entrance handles 430,000 cabs a year.

Off-street parking facilities, privately policed, provided immediately adjacent to the Mart, are free to buyers and at low rates to others.

Not only has this highly concentrated centralization of business enterprises in the Merchandise Mart been profitable to its owners and tenants but it has been a public benefaction as well.

**Value of Adequate Transportation Shown**

These and other benefits attest the value of adequate and *properly balanced* horizontal and vertical transport facilities, without which Rockefeller Center, Chicago Merchandise Mart or other developments of similar magnitude, would be impossible. They also demonstrate that, under situations of favorably organized horizontal and vertical transportation, huge concentrations of people and enterprises, not normally considered feasible, are both possible and advantageous. Moreover, such properties have a very high percentage of occupancy at higher rental rates than adjacent properties, poorly served by transportation, do not enjoy.

These examples suggest interesting possibilities in the development of other new structures and in the modernization of old ones in congested business areas. They also provide valuable food for thought in other directions of interest to persons concerned with problems of urban transportation.

(Adapted from a paper presented before meeting of American Society of Civil Engineers, Atlanta, Georgia, 1943, and published in *Civil Engineering*, February, 1944).

# A Short-Count Parking Check Method For Cities

*by* HENRY K. EVANS, *Assoc. Member, I.T.E.*
*Director, Traffic Engineering Division, National Conservation Bureau*

Which shall we use in the proposed parking survey, a shot gun or a rifle? Shall we go into the city business district and count traffic for 24 hours on every street and alley, and take license numbers of every vehicle that parks in every street, alley, lot, garage, and driveway? (The shot gun approach).

Or shall we just check several pertinent facts at certain hours on certain streets? (The rifle approach).

When manpower is scarce, or survey money not free for the asking (as it used to be in WPA days), it is obvious that the "rifle approach" is necessary. It occurs to me that perhaps, even when money and manpower is available, that it would be better to spend it on a broader study including more phases of traffic, but to keep to the rifle approach on the parking problem.

The modern selective enforcement procedure aims at certain specified sore spots, rather than spreading an even blanket of enforcement. The parking problem can and should be approached on the same basis.

### The Medical Approach

When a doctor first calls upon an ailing patient he generally applies several simple tests, such as taking the body temperature, checking the pulse rate and perhaps looking at the patient's tongue, skin and eyes.

The Doc doesn't start right off with a basic metabolism test, X-rays, and all the other extensive and detailed surveys that may be made in certain cases.

Similarly, it is possible to apply several spot checks to city business districts suffering from parking ailments, and come up with helpful remedies, without making extensive surveys. We at the Bureau have worked out and used a short count method of studying parking recently, primarily because of the lack of manpower to conduct and analyze all-out parking studies.

### What the Short Count Does

The short count method we have evolved does two things:

1. Measures the seriousness of the parking deficiency.
2. Indicates whether or not the following parking "diseases" are present.
   a. All-day parkers at curb
   b. Improper or inefficient time limits
   c. Poor enforcement of existing parking regulations
   d. Lack of sufficient off-street facilities
   e. Buses and trucks blocking traffic by loading and unloading operations.

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### VISIBILITY OF TRAFFIC SIGNAL LIGHTS AGAINST SHIELDS OF DIFFERENT SIZES

As a result of experiments designed to measure the visibility of traffic lights against a black screen of varying size, it has been established that the minimum size of screen for optimum visibility is one that subtends at the eye an angle of 12 min.; when the subtended angle is less than 3 min. visibility is worse than with no screen at all.—*Highway Research Abstracts.*

It appears to me, after looking over the many parking survey reports and making many parking studies myself, that these latter five ailments are the most frequent sources of parking troubles. So it is a logical step to check these items first, just as a doctor might first look for several well-known and specific diseases before going into any detailed examinations. Experience has shown that in most cities parking headaches can be remedied by one or more of the following simple remedies.

1. Get all-day parkers off the streets into parking lots or get them to leave their cars at home or outside the congested area and use public transit or walk to get to and from this area.
2. Extend the parking time limit over a greater geographical area.
3. Tighten up on enforcement of existing time limits. This is a job of enforcement.
4. Provide more or better located off-street loading and parking facilities.
5. Provide proper and adequate bus and truck loading zones.

*Then why not simply check whether any of these improvements are applicable?* In other words, why not approach the problem on a selective basis? The method which we have used to do this simply and with a minimum of manpower is described in the following. The check is broken into two sections, (1) Accumulation and (2) Duration.

## Accumulation Check

### Purpose

Briefly, this check discloses how much parking there is in each block, what part of it is in illegal zones, and where and how many all-day parkers are parked.

### Manpower Required

The field survey requires a team of 2 men for 1 to 3 days for cities under 100,000 population. If more men are available, it would be desirable to have 2 teams or 4 men work 1 to 2 days. A team consists of an observer who rides in a car driven by another person. The observer should be preferably a traffic engineer, while the driver should be someone well acquainted with the street system, such as a police officer. The car should not be a police car, nor the officer (if an officer drives) in uniform. In other words, the fact that a check is being made should not be obvious.

One team of driver and observer can check a maximum of 800 license numbers, including off-street, in a 2-hour period.

### When to Check

The team should check parking accumulation between 9:30 A.M. and 11:30 A.M. and between 2:00 P.M. and 4:00 P.M. on one or more normal week days. (Not Saturday or Sunday). It may be possible to cover the entire area in one day. If not, the uncompleted (geographically) portion should be completed on the second day (and third day if necessary).

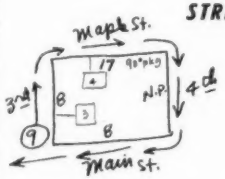
### The District to be Studied

Generally the study will be concentrated on a business district and surrounding streets where business district shoppers, etc. usually park their cars. This area extending several blocks beyond the stores and offices of the business district is commonly known as a parking district.

The area including the city's central business district would be termed the central parking district, which is frequently the target for traffic studies.

## STREET AND OFF-STREET PARKING

### FIELD SHEET




Date .....
Weather .....
Recorder .....

| A.M. | P.M. | A.M. | P.M. | A.M. | P.M. | A.M. | P.M. |
|---|---|---|---|---|---|---|---|
| 1V3826 | THIRD ST. 3V6463 | 7V3534 | ✓ | | | | |
| 409344 | 409343 | NC6906 | ✓ | | | | |
| – | 409603 | 8V4536 | ✓ | | | | |
| ~~425-375~~ | ~~425-375~~ | 20573 | 1V5466 | | | | |
| 6V48.73 | 409.344 | | 4th No Parking | | | | |
| 4V19.26 | – | | | | | | |
| 6V48.75 | – | | | | | | |
| 409.603 | – | | | | | | |
| 19478 | Maple – | Main 9T73.60 | – | | | | |
| 19480 | ✓ | 9V199 | – | | | | |
| | WE3088 | – | 8V5295 | | | | |
| WE4788 | 1V3494 | – | V9715 | | | | |
| – | – | – | 1V2141 | | | | |
| ~~636.24 DP~~ | | | | | | | |
| 19479 | ✓ | 123105 | 226932 T-DP | | | | |
| – | 6V6310 | 9V4491 | 2V5522 | | | | |
| 9V8441 | ✓ | 3V2590 | V6884 | | | | |
| 6V6310 | 7V6718 | 409.343 T-PZ | 26778 T-PZ | | | | |
| 1V3494 | 7V7377 | | | | | | |
| — | 2V111 | | | | | | |
| 7V9810 | ✓ | | | | | | |
| 7V9669 | ✓ | | | | | | |

FIGURE 1. A typical field sheet. PZ means "in prohibited zone." DP means "double parked."

**Master Map**

This should be prepared prior to the field check, covering the entire area to be studied. It may be convenient to sketch this master map, or on the other hand, if a printed one is available, about 200 ft. to the inch scale, it may be used. The purpose of the map is to show each block to be covered, the block number and the route for the driver to follow (taking proper account of one-way streets, etc.). On this master map should be recorded the number of legal parking spaces at each block curb face as well as any known off-street lot and garage capacities in car stalls. If the curb data are not on hand, it will require a preliminary reconnaissance to obtain the number of car stalls at each block curb face. The off-street parking lots and garages capacities can be obtained at the time of the field accumulation check, if the data are not already on hand. The purpose of obtaining the curb capacities earlier is to properly proportion the field sheets, discussed in the next section.

In laying out the routes, it has been found best to start at one corner of the district and drive clockwise around each block, moving from one block to the next. One-way streets, and unusual street lay-out may force some variations in this system.

**Field Sheets**

These are to be prepared in advance of the field check, and numbered according to each square block, using the master map as a guide. Ordinary lined paper can be used (such as comes in tablet form) on which to make up these forms. A copy of the National Conservation Bureau form is shown.

A sketch at the top of each sheet, showing the route around block covered, will be a great help in the field, and is a practical necessity to smooth and fast field operations.

The field sheet allows one column for recording license numbers in the A.M. check, and an adjacent column for the P.M. check. The two columns (A.M. and P.M.) should be divided into sections to correspond to block faces. For a regular 4-sided block, this would indicate 4 sections. Each block face section should contain horizontal blank spaces to equal or exceed slightly the number of curb parking spaces which are known to exist (shown on the master map).

The reverse side of each sheet is to be used for recording the data and accumulations in parking lots and garages. Figure 1 shows a typical completed field sheet. In the sketch at the top, the boxes 3 and 4 refer to parking lots, detailed on the back of the sheet. The figure 9 encircled is the block number and start of the route around this block.

**Making Observations**

Following the prescribed route, circling blocks, the car with observer and driver threads its way through the district, driving into every off-street parking lot or garage where more than 5 cars could be parked at one time. While being transported along the street during the first round in the morning, the observer writes down every vehicle's license number in the A.M. column plus a special indication if the vehicle is double parked or in a prohibited zone. Corresponding letters "DP" and "PZ" might be used here. Empty curb spaces are denoted by leaving a corresponding blank space at the proper point in the field sheet.

As each parking lot or garage is reached, these data are to be recorded on the reverse of the field sheet being used; (1) name of lot or garage, (2) capacity in cars, (3) license numbers of parked cars, (4) statement of type of parking, whether private, customer, free or public pay (5) parking fees (if public pay facility).

Even if the area is not completely

FIGURE 2

SUMMARY OF PARKING ACCUMULATION STUDY
MORRISTOWN CENTRAL PARKING DISTRICT
(A Typical Friday in January, 1946)

| Block No. (See Chart I) | CARS AT CURB | | | | CARS OFF-STREET | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Capacity | A.M. Check | P.M. Check | All Day | Capacity | A.M. Check | P.M. Check | All Day | Capacity | A.M. Check | P.M. Check | All Day |
| 1 | 83 | 43 | 35 | 14 | 75 | 16 | 13 | 10 | 158 | 59 | 48 | 24 |
| 2 | 127 | 71 | 99 | 16 | 75 | 26 | 25 | 17 | 202 | 97 | 124 | 33 |
| 3 | 101 | 54 | 98 | 0 | 0 | 0 | 0 | 0 | 101 | 54 | 98 | 0 |
| 4 | 97 | 27 | 48 | 13 | 40 | 4 | 3 | 1 | 137 | 31 | 51 | 14 |
| 5 | 101 | 73 | 74 | 5 | 90 | 70 | 64 | 46 | 191 | 143 | 138 | 51 |
| 6 | 73 | 22 | 27 | 4 | 0 | 0 | 0 | 0 | 73 | 22 | 27 | 4 |
| 7 | 87 | 48 | 50 | 10 | 0 | 0 | 0 | 0 | 87 | 48 | 50 | 10 |
| 8 | 111 | 26 | 39 | 10 | 0 | 0 | 0 | 0 | 111 | 26 | 39 | 10 |
| 9 | 75 | 57 | 55 | 29 | 62 | 24 | 26 | 7 | 137 | 81 | 81 | 36 |
| 10 | 26 | 20 | 18 | 3 | 31 | 26 | 30 | 13 | 57 | 46 | 48 | 16 |
| 11 | 45 | 35 | 45 | 16 | 33 | 17 | 13 | 6 | 78 | 52 | 58 | 22 |
| 12 | 61 | 40 | 42 | 9 | 15 | 12 | 10 | 10 | 76 | 52 | 52 | 19 |
| 13 | 48 | 36 | 39 | 6 | 150 | 141 | 147 | 109 | 148 | 129 | 138 | 67 |
| 14 | 58 | 41 | 30 | 9 | 30 | 8 | 6 | 4 | 88 | 49 | 36 | 13 |
| 15 | 88 | 31 | 69 | 11 | 85 | 29 | 46 | 9 | 173 | 60 | 115 | 20 |
| 16 | 59 | 35 | 34 | 21 | 15 | 6 | 7 | 5 | 74 | 41 | 41 | 26 |
| 17 | 83 | 25 | 25 | 8 | 0 | 0 | 0 | 0 | 83 | 25 | 25 | 8 |
| Totals | 1323 | 684 | 827 | 184 | 701 | 379 | 390 | 237 | 2024 | 1063 | 1217 | 421 |

covered by 11:30 A.M., observations should cease, and then the same area covered again between 2:00 and 4:00 in the afternoon. The study is to be stopped at 11:30 A.M. because people begin unparking their cars to go to lunch at that time. In the afternoon study, on the other hand, it would do no harm to run past 4:00, to say 4:30 or so, if the study area covered in the A.M. check has not been covered by 4:00 P.M. This might be the situation if afternoon accumulation is lots heavier than A.M. accumulation.

During the afternoon check license numbers are entered in the P.M. column. Since the same area is covered in both checks on the same day, any car which remained at the curb for 4½ hours or more will be revealed when the license number in the P.M. column is seen to be the same as the one in the A.M. column. A check mark can be used to denote an identical number in the P.M. column, saving rewriting the entire number and simplifying picking out the all-day parkers.

#### Analyzing Results

A simple tabulation of capacity, number of cars observed in A.M. check, number observed in P.M. check, and number of all-day parkers (cars seen in both checks parked at same spot) should be made up first. This summary sheet shows which blocks are filled to capacity, and which are relatively uncongested. Figure 2 shows a typical summary from Morristown, New Jersey.

Since the afternoon tour is a check of the number of parking spaces open during the period of peak parking demand (between 2:00 and 4:00 P.M.) it furnishes a good indication of the extent of the parking problem. For instance, in the New Rochelle parking check, it was found that out of 1516 curb spaces, 897 were occupied, or that there were 619 empty parking stalls in the afternoon when we circulated around through the central traffic district. In other words, here were 619 opportunities to park, which indicated that the problem was not very serious on a district-wide basis. However, on the two main business streets there were not so many opportunities to park, as brought out in the analysis of parking block by block (See Figure 3).

These two checks, A.M. and P.M., show the presence of all-day parkers (See Figure 4) revealed by identical license numbers observed in the same spot in both checks. We generally find most of the all-day parkers are at the curb within a block of the two main business streets. It seems obvious that, to provide more opportunities to park, these all-day parkers should be ruled off the streets, at least in the congested area (blocks more than 75% filled). Therefore, extension of time limits to cover the congested areas is the logical recommendation.

Quite a lot can be learned from this simple check of A.M. and P.M. accumulation, both regarding capacity and demand for on-street and off-street parking. The simple ratio of parked cars to spaces available, or per cent of capacity filled is a pretty good criterion of the seriousness of the problem. Double parking, commercial vehicle loading, bus loading, and hazardous parking are items that are noted during this accumulation check.

### Duration Check

#### Purpose

This sample check of parking durations is made with the end in view of determining for the typical afternoon period the average duration of parking in time limit zones and the number and location of overtime parkers.

#### Manpower Required

For cities under 100,000 poulation, at least one team of driver and observer will be required, working from

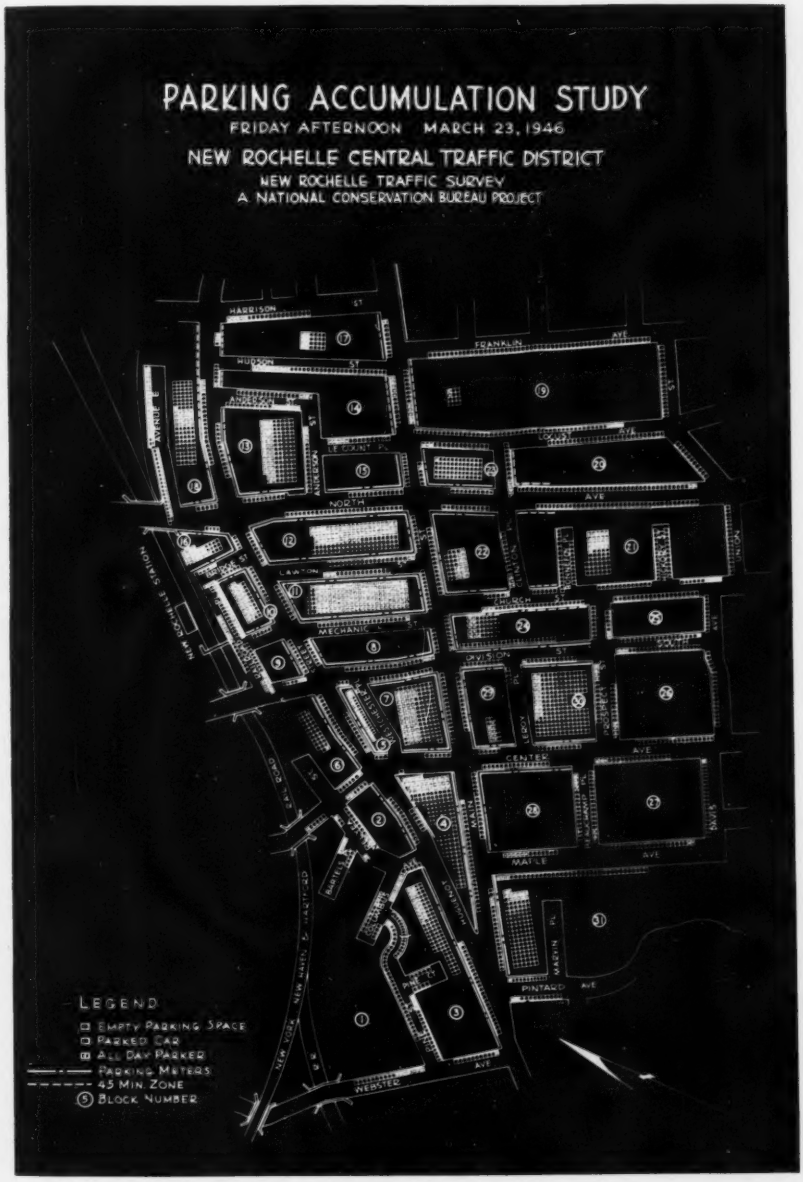



FIGURE 3. Afternoon peak parking accumulation, both on and off-street, showing all-day parkers too.

FIGURE 4. This map is based on an Accumulation Check. Note location of all-day parkers, where 23 of them were in 2-hour limit metered zones.

1:10 P.M. to 4:50 P.M. on several succeeding week days. On foot, an observer will take a little longer to complete the study.

A team in a car can check more than 100 car spaces in one 20-minute period, hence the total manpower can be evaluated by dividing the number of curb parking spaces (in time limit zones) by 200. This will give the number of teams needed to complete a duration check of half of the time-limit zones on one day. (As brought out further on, a 50% sample of the restricted zones is enough to give reliable accuracy). If it is desired to use men on foot, the number of men needed can be estimated by dividing by 80 instead of 100 as in the above formula (Since one man can cover 40 car spaces in a 20-minute period).

The duration check can be spread over 2 or 3 days if necessary, thereby making it possible to employ a smaller number of men for a longer period, if desired.

#### When to Check

Observations should be made between 1:10 and 4:50 P.M., by 20-minute intervals. In analyzing the field sheets, only the license numbers seen for the first time in the second or subsequent 20-minute period, and not seen in the final 20-minute period, can be used. Licensed numbers seen in the first and last periods are not usable since it is not known when they started parking or finally left the curb.

#### Where to Check

Regular posted time limited zones only in the parking district (within 2 or 3 blocks of offices and stores) are to be checked. Generally this will include 1-hour or 2-hour zones. If a considerable number of zones of less than an hour maximum limit exist, these should be included too. Sometimes there are just a few 15 min. zones in front of banks, etc., in which case they can be ignored for purposes of this survey.

Pick a group of block faces including about half of the time limit zone curb car spaces for the check. Distribute the 50% sample as evenly over the entire district as possible.

#### Field Sheets

The standard duration study field sheet, such as shown in the Manual of Traffic Engineering Studies, N.C.B. Form 533 (A National Conservation Bureau publication), may be used, employing a separate vertical column for each successive 20-minute period.

#### Making Observations

The observer and recorder keep going over and over the prescribed route, repeating a trip every 20 minutes. The car should not be an official car, nor should either occupant be in uniform. The observer records license numbers according to the standard procedure. It may be found convenient for the driver to call off the license numbers for the observer to record.

If checkers are to travel on foot instead of riding, each checker should cover his route once every 20 minutes.

#### Analyzing the Results

By tabulating the number of successive times a license number was seen, the percentage of vehicles parked for 20 min., 40 min., 60 min., etc. up to 3 hours can be found. Assume that once seen is equivalent to 20 minutes duration, twice seen is 40 minutes, etc. Tabulate only vehicles seen for the first time in the second 20-minute period and vehicles not seen in the last 20-minute period. Complete durations in these cases are not known.

Now this sample may be expanded to equal the total time limit zones in the business district, if desired, or the

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figures used, as they are, to show (1) average duration, and (2) per cent parking over the time limit.

If the check shows a considerable percentage of overtime parkers, then it is apparent that enforcement is lacking. Before simply recommending increased enforcement, it would be wise to seek the reason for lack of enforcement. The reason for this lack of enforcement might be time limits which are too stringent or located wrong geographically, or perhaps limits not practical to enforce, such as extensive 10-minute zones.

If this sample duration study shows much overtime parking, say over 15 or 20%, then the reason should be ascertained, assuming it is desired to increase parking turn-over by eliminating overtime parking.

**Practical Aspects of Limitations In Sampling Method**

This sample method takes no note of durations of parking in unrestricted zones. A larger area could be covered by including 40% to 50% of the unlimited parking area of parking survey. Vehicle space-hours potential against actual, average duration, etc. could be figured for the unrestricted zones, but here we are getting away from the specific selective approach originally set up—to discover how effective the existing time limit regulations are.

Maximum errors incurred in sampling time limit zones on a 40 to 50% basis may run as high as 20% on per cent of overtime parking, and 10% on duration. For a detailed treatment of this, see the 1946 *Proceedings, Institute of Traffic Engineers*, under my report on "Short Count Parking Studies," where the results of an intensive analysis of parking survey data from four cities are shown to prove the reliability of parking short count studies. Figures 5 and 6 (shown later) are taken from the *Proceedings* article.

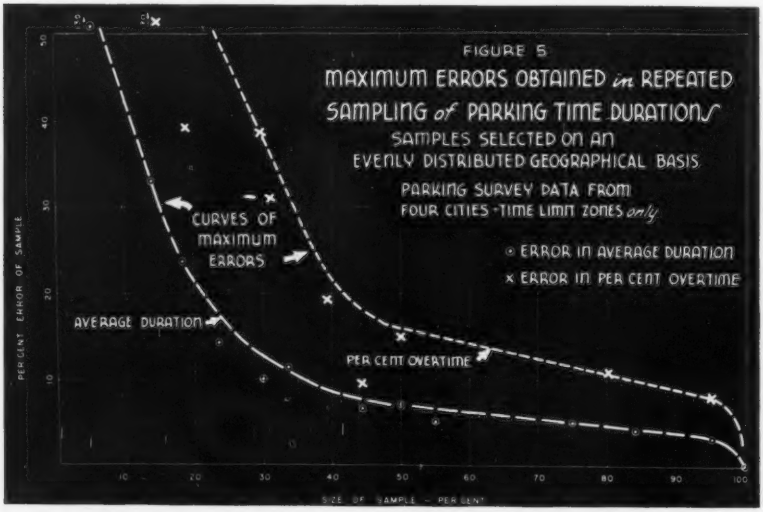
Assume that a complete business district parking survey from 7 A.M. to 8 P.M. shows 37 minutes average duration of parking in the one-hour time limit zones. A 40% sample might show average duration as much as 10% off—say 33.3 minutes or 40.7 minutes. Suppose that the per cent of overtime parkers, was 20% in the complete survey. A 40% sample might be as much as 20% off, giving instead an answer of 16% or 24% for the percentage of overtime parking.

Wouldn't the parking recommendations be the same in either event, whether the average duration was 33 or 41 minutes? Would the recommendations hinge on whether overtime parkers constituted 16% or 24% of total parkers? No, I think not.

There is another factor too that minimizes the need for any close accuracy on duration and accumulation surveys. That is the normal variation from day to day in parking demand. Peak parking accumulation varies a few per cent from day to day, hence there would be no use in putting absolute reliance on any percentage figures, but rather to realize that the accuracy is somewhere within a few per cent of what a complete parking study might show.

Parking recommendations are based more upon a qualitative rather than a quantitative analysis. It is more important to know *whether* certain parking diseases exist than to know the exact size of their symptoms.

There are sometimes situations where parking surveys cannot be made because of lack of money or manpower, and hence recommendations are made based solely on opinion or on political pressures. This is where I think the short count approach would be especially valuable, to provide the




minimum facts needed with a minimum of manpower.

**Errors in Sampling Durations**

Figure 5 combines the worst possible erors found by repeated samplings of data from various different surveys. For instance in taking 30% samples of different cities' data, the maximum error found in this sample size group was a 33% sample of the Morristown study which showed a duration average of 45.5 minutes which was 12% in error. However, all other 30% samples from Morristown and also from other cities, were less in error.

It is important in selecting the sample that the block faces studied be distributed uniformly over the district. If possible, every street should be represented. In 50% samples I found excellent accuracy from taking every street and selecting block faces on alternating sides of the streets.

Figure 6 shows how the uniformly distributed selection gives more accuracy than a non uniform distribution. From a large number of samples computed under the two systems, (random selection as against uniform geographical distribution selection) the maximum errors found at different sample percentages were plotted as shown in Figure 6. Each point represents one city and shows the maximum error of all errors found for that city. Four cities are represented.

It is repeated — the errors shown

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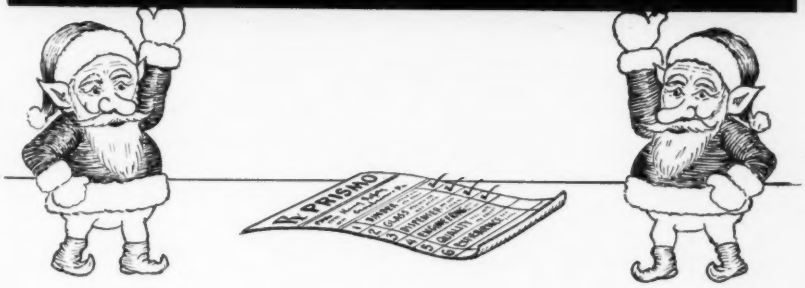


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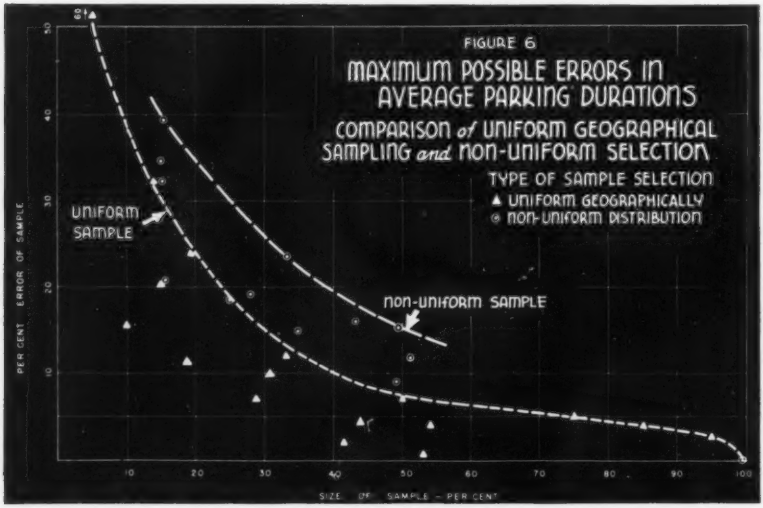
here are not average errors to be expected, but rather they are maximum possible errors. In most cases, sample studies of parking on a 40% to 50% basis will give only three or four per cent error. In fact many smaller samples of 5 to 10% gave remarkable accuracy. However, to be on the safe side, the outside errors were used in Figures 5 and 6.




# *Effect of Light Changes on Traffic Accidents*

*by* LOUIS J. SCHRENK, *General Superintendent, Public Lighting Commission, Detroit, Michigan*

Evidence that the single factor of poor visibility at night is responsible for a large percentage of traffic accidents is contained in an unusual record showing traffic accidents during a period when gasoline rationing and daylight saving time were in effect, compared with the same period under standard time when there was no rationing.

During the last winter of the war, October 1, 1944 to March 31, 1945, gasoline rationing was in effect, and the clocks were set ahead one hour (War Time). The accident record is shown in line (1) of the accompanying illustration.

During the following winter, October 1, 1945 to March 31, 1946, there was no gasoline rationing and

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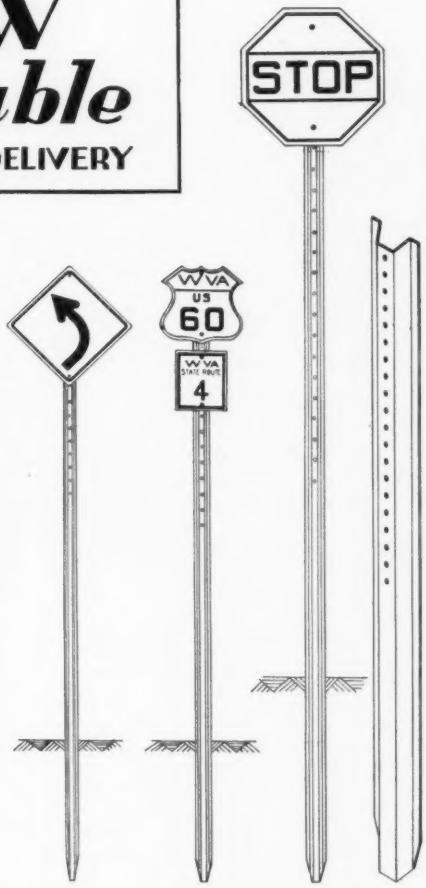


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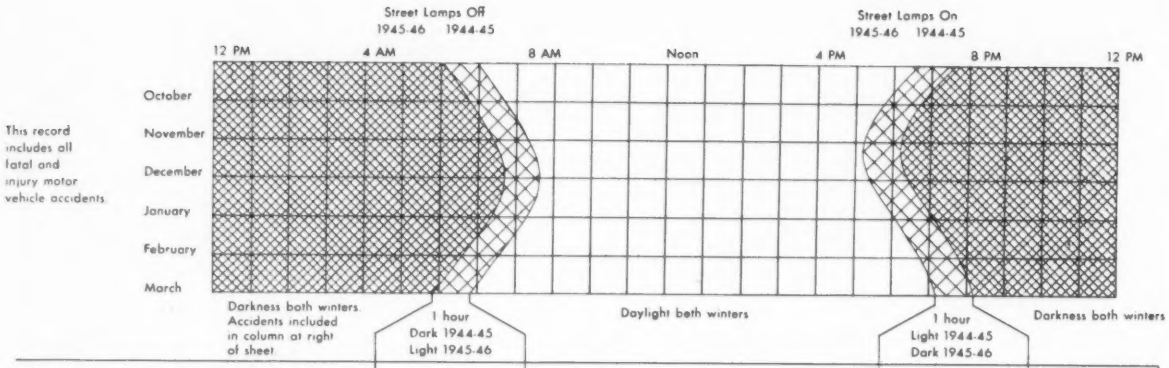


| | | | | | |
|---|---|---|---|---|---|
| (1) | Traffic accidents during six months—October, 1944—March, 1945—Gasoline rationing, Daylight Saving Time | 188 Darkness | 2044 Daylight | 279 Daylight | 2258 Darkness |
| (2) | Traffic accidents during six months—October, 1945—March, 1946—No gasoline rationing, return to Standard Time | 114 Daylight | 2304 Daylight | 386 Darkness | 2633 Darkness |
| | Increase or decrease in accidents | −74 | +260 | +107 | −395 |
| | Percentage increase in accidents during hours when there was no change in lighting. Increase in accidents due to increased traffic | | 12.7% Daylight both winters | | 13.0% Darkness both winters |
| | Percentage increase or decrease in accidents during hours when there was a change in lighting | −38% | | +38% | |

Chart showing comparison of traffic accidents under gasoline rationing and daylight saving time and under no rationing and standard time. Increased hazard resulting from darkness responsible for 18.5% of accidents.

the clocks had been set back (to Standard Time). The accident record is shown in line (2) of the accompanying illustration.

The important factors in comparing the two periods are: Increase in traffic during the second year due to no gasoline rationing, and the effect of the change of the one hour in the morning from darkness to light and in the evening from light to darkness. Traffic is generally heavy during both periods.

When light conditions were unchanged the increase in traffic during the second year resulted in an increase of approximately 13 per cent in accidents during both day and night hours.

The morning hour had 188 accidents in darkness the first year. If there had been no clock change, the increase in traffic next year would be expected to increase this by 13 per cent to 212. The record of 114 accidents during daylight the second year indicates a reduction of 98 accidents or 46 per cent. The only apparent change in conditions was to good visibility.

During the evening hours which had daylight in the winter of 1944-45 there were 279 accidents. If the normal increase due to the greater traffic had occurred, there would have been 315 accidents (279 plus 13%) in the winter of 1945-46.

**Darkness Factor Isolated**

Actually there were 386 accidents. The excess of 71 accidents was evidently due to the increased hazard resulting from darkness. This would indicate that the single factor of poor visibility at night was responsible for 71 out of 386 accidents or 18.5 per cent.

In Detroit the A.M. traffic peak occurs between 7 and 8 o'clock. The P.M. traffic peak occurs between 5 and 6 o'clock. Under the War-Time schedule the A.M. traffic peak hour averaged 25 per cent daylight, and the P.M. traffic peak hour had 100 per cent daylight. As a result of the clock change from War to Standard time schedule, the A.M. traffic peak hour averaged 75 per cent daylight and the P.M. traffic peak hour also averaged 75 per cent daylight. Thus the A.M. traffic peak hour gained twice as much daylight as the P.M. traffic peak hour lost.

This condition materially explains the greater per cent reduction in traffic accidents in the morning peak hour (46 per cent), as compared with the per cent increase in traffic accidents in the evening peak hour (18.5 per cent).

The same condition also points out the fact that for Detroit the Standard Time schedule offers more visibility during peak traffic hours, resulting in increased traffic safety over the War Time or Daylight Saving schedule.

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**NEW PRESIDENT FOR A.S.C.E.**

Edgar M. Hastings, 64, chief engineer since 1922 of the Richmond, Fredericksburg and Potomac R. R., was nominated for the presidency of the American Society of Civil Engineers at the organization's fall meeting at Kansas City, Mo. A past vice-president (1943-44) of ASCE, Mr. Hastings was president of the American Railway Engineering Association (1939-40) and has long been active in professional engineering society affairs. A graduate of Baltimore Polytechnic Institute, he joined the railroad, in 1903, and has served with continuously. —*Engineering News-Record*

# A Business Man's Views on Parking

*by* DANIEL W. WALLS
*Binghamton, N. Y.*

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*Editor's Note: In this second article on parking (see T. E. Magazine, September) by a business man is further evidence that the Traffic Engineer is not alone in the desire for a well planned attack on the problem.*

The big question posed in finding a solution to the parking problem is not in the effort to solve the problem itself. On the contrary, the big question is, WHO is going to do it? For, if any municipality is to enjoy the benefits of adequate and acceptable parking, either the municipality itself, or some other agency must take the initiative and see to it that the job is done.

The act of providing a place to park, whether it be above ground or below ground, an improved garage or an open lot, is a mere matter of engineering and building construction which is being done everyday. To provide and control enough such facilities at locations, and at a price which will be acceptable to the motorist, and be in keeping with the plan of city development, is the answer. But before the plan can take form, there is a lot of work to do.

In order to secure effective cooperation and coordination among the many diverse groups and interests having to do with the problem, some plan of organization is a must. Traffic Engineers put it this way: "The Parking Problem can be solved only through complete coordination of effort. Land owners, building owners and operators, merchants and city officials, must be brought together in support of a common effort to develop a definite and decisive plan of action for financing, constructing and operating off-street parking facilities."

### Strong Leadership Needed

This brings us back to the question: Who is going to do it? The organization of an active committee under an *aggressive leadership* is the first logical step. This committee can be composed of lay citizens, city officials, or a combination of the two, depending upon the mutual relationship which exists between city officials and civic leaders. The most successful committee, however, will be one that is entirely free to act under an aggressive leader who has a reputation for getting things done. Such a committee would, most likely, be sponsored by the Chamber of Commerce or other civic group.

The opportunity to perform a civic service, and the importance of the work which befalls one of these committees cannot be too strongly emphasized; the future health of the city is largely dependent upon the outcome of its efforts. How well the committee succeeds will depend upon the *initiative* shown, and how well the leaders become informed of the problem, including the procedure to follow, and of what assistance traffic and

planning engineers are prepared to give.

When a committee embarks upon the accomplishment of some civic project, it is the usual custom to announce that the plan will be "comprehensive." In actual practice, these comprehensive achievements have somewhat discounted the definition, according to Webster. Irrespective of this fact, however, anything short of a *comprehensive* parking plan will not do. The procedures in reaching the objective should accomplish even more. This is true for the reason that the problem of parking is only one of several other urban problems which are more or less interrelated. All of these problems are matters which relate to city planning, and, money spent in the interest of solving any one of them, should aid in implementing the city plan.

**Staff Service from City Planners**

Therefore, it is imperative that the leaders of a parking committee should have a general knowledge of the origin and growth of our cities, including their present plight, and what trends are shaping the future. Experts and detailed knowledge is something we can leave to the traffic and planning engineers, but a general knowledge is necessary in order to better appreciate their language and techniques, which can, and should be used to advantage, as a staff service, in carrying out the technical aspects of committee procedure.

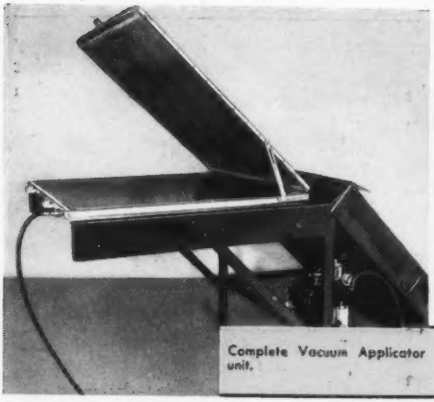
Although the appointment and organization of a committee should be the preliminary step, it seems appropriate to discuss the various factors of the problem first. Fortunately, the basic factors, together with the accompanying trends which influence the growth, or decay, of the city, have, for a long time, been the subject of research and study of traffic engineers, city planning engineers, colleges and other institutions. Hence, the problem, although seeming to be involved and complicated, has been reduced by the above spade work to a point whereby it is subject to classification and breaking down into its component parts for ease of individual study and discussion, from which should evolve decisions on which to shape a policy to be adopted as the final report and recommendation for a comprehensive plan, and the steps necessary to implement the plan into action.

**Traffic Engineers Need Help**

Traffic Engineers and City Planners, while they are well versed in the ills which confront our cities, alone, they are, insofar as practical purposes are concerned, powerless to do much about it. They are in a similar position to the family doctor who prescribes treatment for a patient who is not yet sick enough to take the treatment—or believes he is not.

The difference in the attitude of acceptance between the technician, and the general public, whom we refer to as the taxpayer, when something is to be done which is thought likely to effect his pocketbook, is understandable. The technician is dealing with the facts of up-to-date knowledge of progress and is figuring in the realities of tomorrow, while the public, the taxpayer, is moved mostly as the result of his experiences with the negative effects of progress,

Then, too, since the city official takes his mandates from the man with the vote, he is a prudent official who overcomes these negative effects with measures designed for economy. He has learned that a forthright and comprehensive program which, in the end, would be the most economical, is sure to meet with opposition; and all too often is political dynamite. These circumstances are a "natural" in creating a tendency to defer, or ignore problems which should be given attention, until the problem reaches the emergency stage. When the negative



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effects begin to back up, the demand for action then becomes urgent to overcome the trouble in haste, without regard to plan or forethought, by measures which are termed piecemeal and palliative. These measures, usually temporary expedients, can be exercised to advantage only under certain circumstances—if they are carried out with full knowledge and consideration that they are temporary, or piecemeal measures, which are a part of a developing plan. Otherwise they serve only to postpone and add to the big job which someday must be done, if the city is to survive.

**Citizens Must Be Informed**

Engineers, City Planners and Architects are fully aware of the foregoing paradox and are concerned over the seeming futility of arousing more people to a sufficient awareness in order that principles of democracy may function to an extent necessary to bring about the power of cooperative effort which must take place in order that the job which lies immediately ahead can be done. For example, people in general, although they know better, hold to the opinion, without giving expressive thought, that our cities are static—they always have been, and always will be what they are, with little change from the present. New modes of transportation may come and go, but, our cities—they never change, so we think.

As business men, we are preoccupied, hence, give little thought to our civic surroundings, except to the things of immediate concern. We look upon pictures and remains of cities from other eras as though they were something from another world, whereas, if it were possible to show by moving picture, a continuous record made up from a "short" taken at intervals, extending back through the ages, the changes in continuity would be barely perceptible. Also, it would be apparent that the changes of long ago would proceed at a much slower pace than is now taking place. In fact, the changes effecting our cities within the last one hundred and fifty years would equal the changes of many hundreds, yes, thousands of years. Furthermore, if this moving picture could be projected into the future, the change would continue at an accelerated pace.

**Reluctant to Admit Negative Effects**

The fact of the matter is that this change, which is directing our course toward a richer and fuller life in the adaption of advanced knowledge of science and technology, is being retarded by the inhibiting forces of obsolescence — economic, political and physical. People who have accepted the benefits and luxuries made possible through modern technology, are reluctant to admit to the negative effects which usually follow in the wake of modern improvements. This is especially true in defining the responsibilities for the maintenance of parking facilities in the congested business section of the city. This section is generally located in the older part of the city in close proximity, if not in the midst, of many old tenement blocks, loft buildings and other old structures in various states of disrepair and decay.

These old buildings are many years past their usefulness; they are fire traps, eyesores ,and a menace to public health and safety, and are a habitat for vice and crime. They are the areas of slum and blight which cost the city more for fire, police and health protection than they return in taxes.

A *summary* of the foregoing paragraphs indicate that: (1) A solution to parking must come about as a democratic process; by acceptance and approval of the public.

(2) In order that the public may

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"Traffic counts taken before gasoline rationing are proving valuable in determining what roads should be included in this program from a traffic standpoint."

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approve and accept certain changes of planned order that must take place within urban communities, they, the public, must become informed of what actually has been, and still is, taking place under unplanned disorder.

# Accident Prone Drivers in Connecticut

*by* RICHARD E. SIMPSON, *Research Consultant*
*Connecticut State Highway Safety Commission*

Much has been written about the "accident prone" workman—the man who, in the course of his daily tasks, is continually involved in accidents ranging in severity from a visit to the first aid cabinet or room to days or weeks of lost time. Although workmen of this type are relatively few in number representing only a small indeterminate percentage of the total employed. they constitute a real problem to the management of every large industrial concern.

These men may be awkward or clumsy or they may be unusually dexterous, but rely too much on their dexterity, or they may be careless, indifferent or habitual chance takers. Whatever the reasons, they are involved in an abnormal number of industrial accidents.

There are about twice as many automobile drivers as there are industrial workers in the Nation. It seems logical to expect that the influences which produce accident prone workers will be present and produce a like proportion of accident prone drivers. However, there is a difference in the fact that the danger areas of industrial machines are so well guarded that it is often physically impossible for a workman to be injured unless he deliberately removes the safeguard. That is, the safeguard is a physical obstacle or barrier to the occurrence of an accidental injury.

### Traffic Safeguards Not Foolproof

It is true that danger areas on streets and highways are "safeguarded" by warning and stop signs and by traffic signals, but these do not constitute a physical barrier which necessarily influences the conduct of the driver. He may and often does disregard them at his own risk and unfortunately the risk of others if he is so inclined. In other words the accident prone automobile driver has more liberty of action, more freedom to exercise his chance-taking proclivities than has the industrial worker.

### Case Histories Studied

By way of getting some light on this subject we obtained the driver histories of the 234 known drivers (there were 11 hit-and-run fatal accidents) who were involved in 197 fatal accidents causing 210 deaths in Connecticut during 1944.

In 69 of the accidents, with 74 deaths, the 71 drivers had not been involved in a previous accident or violation of the regulations. There were 163 drivers with a combined his-

tory of 293 previous accidents, 168 previous violations of regulations in the remaining 128 fatal accidents in which 136 persons were killed. Including the 1944 fatal accidents, these 163 drivers had been involved in 589 accidents or violations or an average of 3.6 per driver.

There were 32 accidents in which 35 persons were killed and 43 drivers involved, each of whom had been in at least 5 previous accidents or violations. The average involvement was 6.8 per driver.

Finally there was a group of 15 accidents with 16 deaths and 16 drivers whose accident history to date averaged 9.3 accidents per driver.

**Accident Prone Drivers Revealed**

The outstanding cases are as follows:

One driver with 7 accidents (one previous fatal) 1 violation
Simple negligence

One driver with 11 accidents (one previous fatal) 5 violations
Criminally responsible

One driver with 16 accidents (two previous fatals) 4 violations
Exonerated

One driver with 15 accidents (two previous fatals) 1 violation
Exonerated

Here we have four drivers whose combined history to date includes 49 previous accidents, 10 violations, 4 current fatal accidents, 6 previous fatal accidents, a total of 10 fatal accidents and an average involvement of 16 accidents per driver.

The driving experience of the known drivers in the 197 fatal accidents was 14 years and ranged from two days to thirty-nine years.

Without any attempt to determine or indicate the significance, it is interesting to note that the 234 drivers involved in the 208 fatal accidents have to date an accident and violation history of 2.8 per driver as contrasted with .06 per driver for the 605,200 licensed drivers in the State.

## SOUTH AFRICA HAS PARKING PROBLEMS, TOO

An interesting letter from C. V. Tiran, chief traffic officer of Port Elizabeth, South Africa, recently was received by Edward J. Kelly, International Association of Chiefs of Police executive secretary. Officer Tiran described some of the traffic and parking problems he is encountering. He said, in part:

"Here in Port Elizabeth I am faced with a problem which I consider almost second to none. Can you picture a city with a population of approximately 150,000 and the downtown area consisting of one long central thoroughfare, in parts wide and in parts narrow? On the west side of the thoroughfare are large buildings and behind these very steep hills. The few roads that lead up to these hills, by virtue of their gradient, are lost to traffic and parking. On the east side there are also large buildings with narrow streets running down to additional arteries and eventually the sea. These side streets are so narrow that I have been forced to declare one-way traffic streets and perforce to prohibit parking on the non-traffic side.

"In the main artery I have a time-restricted parking of half an hour, and the turnover of each individual parking bay averages 14 cars per 8 a. m. to 6 p. m. day. There is absolutely no accommodation in the downtown area for the off-street parker and I am afraid that, save expropriating certain properties, no other solution can be found.

"I agree that parking meters are no solution to the problem, and it is no use installing this method of control until such time as provision is made for the off-street parker. Furthermore, I would state that at the moment no city in the Union of South Africa has installed parking meters. I do know, however, that in Johannesburg this question has been discussed at length but so far no finality has been reached. I shall be only too pleased to keep you advised of further developments in this country."

# New Skidding and Traction Data Found in Houghton Lake Tests

*by* Ross Wilcox, *Secretary*
*Committee on Winter Driving Hazards, National Safety Council*

Additional technical data on the skidding and traction characteristics of heavy vehicles under winter conditions is now available to traffic engineers, with the release of a report of tests made early in 1946 by the Committee on Winter Driving Hazards of the National Safety Council.

Headed by Ralph A. Moyer, research professor of highway engineering at Iowa State College, the tests supplement a similar study of skidding and traction with passenger cars conducted in 1940 on Lake Cadillac. The 1946 truck study was made at Houghton Lake, Michigan.

### Summary of Results

Test findings are summarized below:

1. Temperatures near freezing are more dangerous than zero temperatures when driving on ice. Wet ice greatly increases braking distance and acceleration time of bare tires.

2. Glare ice requires nearly nine times as much distance to stop as dry concrete. On drive wheels only, standard chains reduce this to three times as much distance, and premium chains to twice as much.

3. Pumping brakes and gearing down is better than locking the brakes on ice.

4. Sanders are effective only if the right kind of grit is used.

5. Chains aid acceleration on ice, but in this respect premium chains do not show a marked advantage over standard.

6. Automatic locking differentials help acceleration when only one drive wheel has traction.

7. Chains permit some increase in speed without side skidding on curves.

8. Natural rubber tires are superior to synthetics in stopping and accelerating on ice.

### Purpose Two-fold

The purpose of the research program was two-fold: first, to make a limited investigation of skidding characteristics of heavy vehicles on ice, and second, to develop testing techniques for a more comprehensive study later.

The tests were hampered by adverse weather, which prevented complete investigation with the largest vehicles and full loads, but more than 700 stopping, circle and acceleration tests were run during a two-week period from January 7 to 18.

The tests, while incomplete in some cases, revealed some new facts and corroborated others. Engineers have known that wet ice near thawing temperature is far more slippery than "dry" ice. The 1946 trials showed a range in braking distance of 103 feet through a temperature range of 22 degrees. A passenger car equipped with synthetic tires traveling 20 m.p.h. stopped in 122 feet at 10 degrees above zero, but required 225 feet at 32 degrees. The higher the temperature, the greater the rate of change, and the effect of temperature on acceleration and circling is comparable, the report states, although specific results were not obtained.

### Value of Premium Chains Shown

The most noteworthy development in the tests of tire chains was the ex-

traordinary stopping power of premium chains, an experimental cross-chain for trucks which has a special tread to gear the tire to the ice. These chains on drive wheels alone had more effect than standard chains on all four wheels.

The combined average braking distances of the 1½-ton and the 5-ton trucks, obtained by locking the brakes at 20 m.p.h,, were 193 feet for bare synthetic tires on ice, 66 feet for standard chains on rear, 50 feet for standard chains on front and rear, 46 feet for premium chains on rear, 31 feet for premium chains on front and rear, and 22 feet for bare tires on dry concrete.

Pumping the brakes instead of locking them was found to be more effective, although the trials had the advantage of skilled test drivers. By pumping and gearing down, bare synthetic tires were stopped in 130 feet at 27 degrees, as compared with 166 feet by locking—a reduction of 22 per cent. Also, better directional control was maintained.

Among those present at the winter traction tests were (front row, left to right) William A. Biddle, General Motors Proving Ground technician; Reed Harris, Michigan State Police; T. J. Carmichael, co-director of the test program and General Motors Proving Ground experimental engineer; H. H. Abbott, International Harvester Co.; Bellman D. Jones, Safe Winter Driving League; J. J. Farkas, Ford Motor Co.; Lyman Daniells, General Motors Proving Ground; Barbara Jane Williams, Roscommon, Mich., snow queen; Edward Greter and K. A. Stonex, both of General Motors Proving Ground; George E. Miller and Ross G. Wilcox, National Safety Council; R. W. Spinner, General Motors Proving Ground; S. F. Baker, Thornton Tandem Co.; G. A. Stonex, General Motors Proving Ground; Jesse Green, local resident; C. W. Dart, American Chain & Cable Co.; C. J. Crainean and J. A. Spicer, both of Thornton Tandem Co. (Standing on center truck, left to right) John H. Harding, Iowa State College, and H. V. Larson, Four Wheel Drive Auto Co. Others in the photograph are unidentified local residents.

**Difference in Sanders**

Incomplete tests with sanders were run on two types of safety grit, and a remarkable difference in performance was revealed. One grit, a flat smooth grain, had virtually no effect on braking distance. The other, an irregular sharp mass, produced shorter braking distance than bare ice. The average distance at 28 degrees was 122 feet with the sharp grit and 209 feet with the smooth.

**Acceleration Time**

Wide variations were found in acceleration time. On dry concrete the average time for a 1½-ton truck to accelerate through a speed range of 10 m.p.h. was 1.9 seconds, with bare tires on glare ice 14.6, with standard chains on glare ice 3.8 seconds, and with premium chains 3.5 seconds. While both types of chains greatly helped acceleration, the premium chains did not show the marked superiority evident in braking.

Two ½-ton trucks, one of them equipped with a standard differential and the other with an automatic locking differential, were tested for acceleration. Under ordinary procedure, no appreciable difference was apparent. However, when one drive wheel was given traction with chains, allowing the other to spin, the locking differential required only about one-fifth the time to accelerate from 0 to 20 m.p.h. as the standard vehicle under similar conditions.

Experimental instruments were not entirely successful in measuring traction ratio, so all results of circle testing are expressed in terms of the maximum speed maintained on a circular path of approximately 200 feet radius. A 1½-ton truck with a load of 8,460 pounds varied from 15.1 m.p.h. with bare tires to 20 m.p.h. with standard chains on drive wheels, 20.8 m.p.h. with premium chains on drive wheels, 25 m.p.h. with standard chains on all wheels, and 27.9 m.p.h. with premium chains on all wheels. Performance with a load of 5,470 pounds was less favorable. The approximate maximum speed for the same test on dry concrete is 36 m.p.h.

**Natural vs. Synthetic Tires**

A sharp variation in the performance of natural and synthetic rubber tires was brought out by the tests. At freezing the average braking distance on ice of synthetic tires was 225 feet, and of pre-war natural rubber tires 193 feet. At 27 degrees the distances were 166 and 151 feet. The report concludes that the

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## ANDERSON, IND. PARKING METER REVENUE ANALYZED

Returns from the 307 Dual parking meters operated in Anderson, Ind., have increased from $21,800 to $22,000 since 1943, figures from Police Chief Maurice Carter show. A five-cent deposit allows two hours of parking, and the meters earn, on an average, $1.30 per meter per week.

By analyzing the earnings and removing meters not earning within 60% of the highest meter, Chief Carter reduced the number of meters in use from 350 to 307.

Traffic safety measures of the Anderson police include the maintenance of a large map showing the location of each traffic accident, with colors differentiating car and pedestrian accidents and indicating points at which fatal accidents have occurred. The map is prominently displayed and is called to the attention of traffic violators who come to the police station to pay fines. Chief Carter also uses the map to reassign patrolmen and patrol cars. —*The American City*

greatest difference between the two types of rubber apparently occurs near freezing temperature, when the ice is wet, with performance becoming more nearly alike as the temperature drops.

Whenever ice tests are conducted, the question arises as to whether lake ice tests are comparable to road ice tests. The Council committee believes that while performance of heavy vehicles equipped with tire chains may differ somewhat on road ice, previous tests of passenger automobiles on both lake and road ice show very similar results.

The complete report of the Houghton Lake tests is now ready for distribution. Copies may be obtained from the National Safety Congress, 20 N. Wacker Drive, Chicago 6, Ill.

## CITIES SPUR TRANSIT IMPROVEMENTS

Quick industrial reconversion keeping unemployment down plus scarcity of new autos has boosted public transit traffic to record heights and caused redoubling of city efforts to improve public transportation according to the American Municipal Association.

Municipally regulated transit systems throughout the nation are rapidly adding new equipment and scheduling new circuits. A record 23,254,000,000 passengers were carried on the nation's urban transit lines last year and many traffic officials expect 1946 figures in big cities to be even higher.

A survey by the American Transit Association indicates an expenditure of $218 million for new transit equipment this year, compared to $83 million in 1945. Of this amount, $125 million is being spent for motor buses, $22 million for street cars and $9 million for trackless trolley coaches.

"Balanced" transit service—involving use of all three kinds of vehicles—was recommended to the Portland, Ore., council recently by the city utilities commissioner following a city-sponsored survey of transit systems throughout the country. In large cities such balanced service would mean use of streetcars on routes with heaviest traffic loads, electric trolleys for routes with medium traffic density, and buses for lightly traveled and feeder lines.

The Portland utilities department made its survey to gather data on which to evaluate the city traction company's application to purchase 175 motor coaches. In almost all the cities covered, including Birmingham, Boston, Dallas, Des Moines, Kansas City, Memphis, and San Francisco, passengers of public transit lines preferred trackless trolleys to other vehicles.

Shuttle bus service from fringe area parking lots to central business districts is being used in several cities as a device to cope with transit and parking problems. Chicago recently began such a service, while the Baltimore city zoning commission has agreed to change restrictions temporarily so shuttle-buses may be tried there from one outlying parking lot. Shuttle-buses also began operation recently in Denver and Atlanta.

# ITE NEWS AND PERSONALS

## INSTITUTE VOTES ON FULL-TIME PAID EXECUTIVE SECRETARY AND OTHER CHANGES

Secretary Smith has mailed to every Member and Associate Member of the I.T.E. suitable ballots and proposed changes to the Constitution and By-Laws as proposed at the 17th Annual Meeting in Columbus.

### Executive Secretary Proposed

According to the first proposal to be decided by vote, the Board of Direction would be given authority to hire a full-time Executive Secretary, who must be a Member or Associate Member in good standing of the Institute at time of appointment. Always in the past the Institute Secretary-Treasurers have been volunteers, like Wilbur Smith, who receive no salary.

### Student Chapters Proposed

The second proposition being submitted to the membership is to sanction Student Chapters, composed of students of schools of traffic engineering of recognized reputation. Before such a Chapter could be officially recognized, the head of the university department responsible for traffic engineering courses would have to endorse the application by a minimum membership of five students. Also the school must have been in operation for five years, and provide a faculty adviser to the Student Chapter, who must be a Member of the I.T.E. In return for annual dues of $2.00 and an annual report, the chapter would receive free copies of the Proceedings and Traffic Engineering magazine, as well as right to wear a special badge, attend I.T.E. meetings and carry a Chapter membership card.

### Extra Vice-President Proposed

According to proposal #3, the Institute would have two Vice-Presidents and six Directors instead of the single Vice-President and four Directors at present (The Board of Direction includes four Directors plus two most recent past presidents). Also only one past president would be on the Board according to the new idea.

### Nomination Procedure Challenged

The fifth proposition relates to the method of nominating candidates for election. It is suggested that every eligible voter be canvassed for nominations prior to making up the ticket of nominees. Also the new plan would require the Nominating Committee to nominate *two* candidates for each office instead of *one* or more, the existing practice.

**WANTED**

Two District Sales Managers (some traffic engineering experience) for well paying agency in pavement markings. Interested parties contact Wilbur Smith, *Secretary*, Institute of Traffic Engineers, Strathcona Hall, New Haven, Conn.

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# PRESIDENT'S CONFERENCE PLAN AND PARKING ZONING SCHEME SUPPORTED BY I.T.E. RESOLUTIONS

According to official action of the members attending the 17th Annual Business Meeting of the Institute in Columbus, Ohio, there was adopted a resolution urging support of the action program of the President's Highway Safety Conference as follows:

*Whereas*, the President of the United States in a timely gesture called together in conference assembled on May 8, 9, and 10, 1946, in Washington, D.C., recognized leaders in the field of street and highway transportation, and

*Whereas*, this conference was charged with the responsibility of developing a plan for a frontal attack on the imminent post-war serious congestion of traffic and accelerated frequency of accident occurrence, and

*Whereas*, the Action Program emanating from the deliberations of this conference included Engineering as one of the eight phases of attack, and

*Whereas*, accepted standard traffic engineering techniques, administration and training were stressed as among the media whereby the Action Program could be put into effect, now therefore be it,

*Resolved*, that the Institute of Traffic Engineers at this 17th Annual Meeting adopt the recommendations of the President's Highway Safety Conference and through the efforts of its organization and individual members continually support this program toward a successful conclusion.

A Resolution urging city officials to pass zoning or building ordinances or amendments thereto requiring that new or reconstructed buildings provide off-street terminal spaces for the loading and unloading of trucks and for the parking of automobiles that would be attracted by such buildings was adopted as follows:

*Whereas*, the traffic engineering profession is vitally interested in facilitating traffic circulation in cities, particularly in their central business districts, and,

*Whereas*, by reason of the dearth of terminal space off-street, excessive vehicular demands are made on city streets, thus creating a constantly worsening parking problem; and,

*Whereas*, a new construction of traffic generators—buildings that attract masses of people in autos and large volumes of merchandise in trucks — will gradually strangulate traffic circulation and thereby continue the erosion of city realty values, unless off-street terminal space is provided for the autos and trucks which they will attract, and,

*Whereas*, a representative group of city traffic engineers from 37 cities recently overwhelmingly expressed the opinion that it would be feasible and desirable to require builders of new and reconstructed buildings to provide off-street space for loading and unloading of trucks and for the parking of autos;

*Now Therefore Be It Resolved*, that the Institute of Traffic Engineers at this 17th Annual Meeting urge city officials to have zoning or building ordinances passed at the earliest possible moment, requiring new or reconstructed buildings or those whose uses are substantially changed, to provide for off-street berths for the loading and unloading of trucks and for the parking of autos.

NOTE: It is recognized that many small establishments could not provide off-street space for loading and unloading and for parking of autos within their property. Nevertheless, it is also recognized that the aggregate load of many small establishments can create significant terminal demand, and the responsibility for providing off-street berths for this aggregate demand is therefore a community or joint responsibility.

## SECTION NEWS

### New York Section, I.T.E. Hears Fred Fisch

John Gibala, new Section President, presided over the first meeting for the year 1946-47 of the New York City Metropolitan Section of the I.T.E. on November 7th at the President Tavern.

The program highlight was an illustrated talk by Fred Fisch, describing the objectives and activities of the recently created Bureau of Arterial Route Planning, New York State Department of Public Works. Exceptional interest in this progressive and comprehensive step forward in highway and traffic engineering at the state level was evidenced by everyone present.

The invitation of the Greater New York Safety Council was accepted for the section to co-sponsor the traffic engineering session at the forthcoming exposition to be held on March 25 to 28, 1947

Those attending were:

J. A. Carrothers
W. Graham Cole
Henry K. Evans, *Vice-President*
Fred Fisch
John Gibala, *President*
Guy Kelcey
Harry Koch
Merwyn Kraft
Lawrence Lawton, *Guest*
Charles Le Craw
Virden Rittgers, *Secretary*
Richard Siver
Paul Stricker
Edward Wetzel
Leslie Williams

The section's next meeting will be held on January 15, 1947 at 6 P.M., which will be convenient for I.T.E. members attending the American Society of Civil Engineers meeting scheduled for that week. Featured will be a talk by Joseph Barnett, U.S. Public Roads Administration on progress over the country in modernizing urban arterials. Place: President Tavern, 43rd at Lexington, N.Y.C. All interested persons invited to attend.

## PERSONAL ITEMS

**Fred T. Fowler** (Member), City Traffic Engineer for Portland, Oregon, had a chance to look over the expressways of the New York area recently. Guy Kelcey and Nathan Cherniack accompanied Fowler on the inspection, which included a visit to the New York Port Authority Developments.

**Nathan Cherniack** (Member) acted as special consultant to Deleuw-Cather and Company in the preparation of a plan for a Union Truck Terminal for Atlanta, Georgia.

The report, recently issued, is a supplement to a previous report by Deleuw-Cather & Company, "A Comprehensive Highway and Transportation Plan for the Atlanta Metropolitan Area."

**Arch Bollong** (Member), Traffic Engineer of Seattle, Washington is ready to start a program of traffic signal installation and modernization in Seattle following the approval of a $75,000 budget for that purpose. Also included in Seattle's Plans for 1947 is the installation of 5 miles of additional rush-hour parking restrictions and the purchase of additional parking meters.

**Guy Kelcey** (Member) reports that the firm of Kelcey and Edwards, Consulting Engineers, have moved from

their office at 120 Broadway, New York, to 50 Church Street, New York 7, N.Y., COrtland 7-2569.

The new office will provide more space for expanding activity in a variety of assignments including expressway design, traffic and transportation and railroad developments.

**Grant Mickle** (Member), Director, Traffic Engineering Division, Automotive Safety Foundation, was one of the speakers in a special parking symposium at the annual meeting of the American Automobile Association in San Francisco last month.

**Pyke Johnson** (Affil. Member), President of the Automotive Safety Foundation and **Sidney Williams** (Member), Assistant to the President, National Safety Council, were speakers at Nebraska's Traffic Safety Conference at Lincoln, Nebraska, October 31 and November 1.

### New Traffic Engineering Committee Appointments

Announcement is made of appointment of four new members of the *Traffic Engineering* Committee.

Joseph Havenner is now *West Coast Circulation Manager*. He is Manager, Public Safety Department, Automobile Club of Southern California.

Russell Harrison, Senior Assistant Traffic Engineer, Detroit City Traffic Engineering Bureau, is to function as *Advertising Manager*.

New *Associate Editors* are as follows: Charles LeCraw, Eno Foundation for Highway Traffic Control, Inc., J. A. Carrothers, Traffic Engineer, National Conservation Bureau, and Henry Barnes, Flint, Mich., City Traffic Engineer.

Send photographs for cover illustrations to Editor. $5.00 will be paid to contributor of photographs thus used.

## ON THE SHELF

*OFF-STREET PARKING STUDY*, City of Pomona, California. Gordon Whitnall, City Planning Commission, City of Pomona. 12 pp. charts. The report discusses the principles of off-street parking and provides a number of alternate methods.

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*AUTOMOBILE PARKING IN CENTRAL BUSINESS DISTRICTS*. Technical Bulletin No. 6; Urban Land Institute, 1737 K Street NW, Washington, D.C. July, 1946. The report contains a review of current parking programs in five cities; a discussion of zoning as a method of providing parking areas in business districts; a discussion of state legislation authorizing municipalities to provide parking lots.

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*THE ENGINEER AT LAW*. C. B. & J. R. McCullough; Volumes I & II; The Collegiate Press, Inc., Ames, Iowa. Books contain a complete discussion of the legal aspects of Engineering; including samples of various legal phraseology needed by engineers. The late C. B. McCullough was formerly Chief Engineer, Oregon Highway Department and writes from the standpoint of the Engineer. The set of two volumes costs $6.00.

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*ANALYZING SELECTED PHASES OF PEDESTRIAN ACCIDENT EXPERIENCE IN CONNECTICUT*. Highway Safety Commission, State of Connecticut; State Office Building, Hartford, Conn. Report includes analysis of pedestrian accidents by time of day, season of the year, age, sex, and the relation between pedestrian hazards and population density.

*PARKERSBURG, W. VA., TRAFFIC SURVEY REPORT AND RECOMMENDATIONS.* Traffic Engineering Division, National Conservation Bureau. A 60-page mimeo report with 10 charts covering survey of parking, one-way streets, enforcement, education, accidents, and traffic control. Copies may be purchased from the National Conservation Bureau, 60 John Street, N.Y.C.

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*DIRECT COSTS OF TRAFFIC ACCIDENTS,* Lansing Michigan, 1946. Study conducted by Lansing Safety Council and National Conservation Bureau. 23 pp. mimeo. 4 charts. Report of results of questionnaire study of accident victims expenses. Limited quantity available at National Conservation Bureau, 60 John Street, N.Y.C. Free on request.

## LOOKING AHEAD

**Washington Section, I.T.E.,** Joint meeting with American Institute of Architects, January 15, 6 P.M., Fairfax Hotel.

**New York Section, I.T.E.,** Meeting, January 15, 6 P.M., President Tavern, New York City.

**American Society of Civil Engineers,** Annual Meeting; January 15, 16, 17; New York City. City Planning Division Session—afternoon of Jan. 15; Highway Division Session—morning of Jan. 16.

### Accident Data From South Carolina

In "Facts About Traffic Accidents" (1945), South Carolina reports 2508 traffic accidents in which 450 people were killed. This was an increase of 47% over 1944. There were 7 accidents for each 1,000 vehicles registered in the state—2.5 deaths for each 100 miles of highway!

Estimated economic loss was $4,191,500, with an average cost per accident of $1,671.25. There were 1,129 of these accidents, 178 of them fatal, that occurred at night on unlighted streets and highways. In the period from 3 to 4 A.M. one out of every three accidents resulted in death. 52 out of every 100 accidents and 55% of the fatalities occurred at night. Accidents in which pedestrians were involved claimed more deaths than any other type, 138 pedestrians being killed and 148 injured. Statistics for the 8 year period, 1938-1945, show that there is an average of 1 death for each 6 accidents.—*Street and Traffic Lighting Bureau Newsletter.*

### American Public Works Association Urges Traffic Conferences

According to a resolution adopted by the American Public Works Association at their recent annual meeting, individual members are urged to give all possible support to the holding of one-day or longer traffic conferences in their respective communities. These are for the purpose of discussing the President's Highway Safety Conference Recommendations and to formulate local action programs embracing:

(a) Uniform Traffic Laws and Ordinances
(b) Accident Records
(c) Safety Records
(d) Traffic Law Enforcement
*(e) Traffic Engineering*
(f) Public Support

At this meeting in Ft. Worth, the Annual Public Works Conference, Samuel Baxter of the Philadelphia City Bureau of Engineering, was elected President of APWA.

### Burlington, Iowa Appoints Traffic Engineer

A City Traffic Engineer, Frederick L. Bell, has been appointed in Burlington, Ia. (population 30,000 approximately) and is carrying out an active program of traffic improvements, according to a recent report.

The first step in this program is the installation of a new and modern street lighting system in the downtown business district.

Second; Parking meters have been installed and an additional number will be added in the very near future.

Third; That part of the "Model Traffic Ordinances" as published by the U.S. Bureau of Public Roads, establishing the office of the City Traffic Engineer, and defining the duties thereof, has been made a City Ordinance. Other articles of the "Model" are being studied by the City Solicitor and other interested citizens, for adoption in part or parts.

### Durham Inaugurates Off-Street Parking

Durham, N. C., has granted a local organization permission to use downtown curb space where shoppers may leave vehicles with attendants who drive them to a nearby 300-car city-owned parking lot, according to the Public Administration Clearing House.

The cars are taken to and from the garage by shuttle schedule. Charge for the service is 15 cents for the first hour and five cents for each additional hour, with a maximum charge of 35 cents. The city also is enforcing a one-hour parking limit.

## 50-MPH LIMIT CUTS N. Y. DEATHS, BUT MISHAPS RISE

The new 50-mile-an-hour speed has had a varied effect during the first month of its existence in this state, but it has not caused the increase in deaths that many persons feared, according to New York officials.

During May, the first month the law was in effect, twenty-eight persons were killed in automobile accidents due to speedings. During the same month of 1941 forty-three persons were killed for the same reason.

At the same time, however, accidents caused by excessive speed increased. A total of 610 accidents were caused by speeding during May of this year. In May, 1941, there were 508 speeding accidents.

Speeding accidents during the first month the law was in existence also showed an increase of 106 over the previous month.

When the new 50-mile-an-hour limit was first proposed by the governor's safety conference, there were many objections. Many people said that neither the cars being driven nor the roads were in a condition to permit the higher speed with safety.

Those backing the law pointed out, however, that the old speed limit had never been rigidly enforced, and that lower speeds could be set wherever necessary.

Since the law has not caused the great increase in deaths which was feared, it is highly probable that the proposed higher speed limits will be permitted when the state's highway program is complete. Speeds as high as 70 mph have been proposed for the New York-to-Buffalo thruway, which will be especially designed to permit the increased rate.

—*A.A.M.V.A. Bulletin*

## 20-29 AGE BRACKET FOUND MOST ACCIDENT-PRONE IN NEW JERSEY

Motor vehicle drivers between the ages of 20 and 29 are involved in proportionately more accidents than any other age group, according to a report by the New Jersey Motor Vehicle Department.

The report, issued recently, said the 20-29 age group represents 26.3 per cent of the registered drivers, but its members are involved in 32.5 per cent of all accidents and 37.4 per cent of the fatal accidents listed this year.

The 30 to 39 age bracket, covering 27.9 per cent of registrations, was said to include the largest number of registered drivers of any in the state, but could be charged with only 26.2 per cent of total highway mishaps and only 26.3 per cent of those resulting in fatalities.

The 17 to 19 "teen-age" category of drivers amounted to 5.8 per cent of the total registered, had 6 per cent of all accidents and 3.2 per cent of the accident fatalities, the survey indicated.

The report also showed that the 40 to 49 group, accounting for 21.6 per cent of the registration, had 19.6 per cent of all accidents and 20.7 per cent of the traffic deaths.

Other figures from the report: 50 to 64 group, 15.4 per cent of registration, 13.5 per cent of all and 10.7 of fatal accidents; 65 years and over, 3 per cent of registration, 2.1 per cent of crashes and 1.2 per cent of fatalities.—*Transport Topics.*

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**The Editor and Staff of TRAFFIC ENGINEERING want to wish our readers a very Joyous Christmas and a Happy New Year.**

## YALE TRAFFIC BUREAU TRAINING TWENTY-ONE MEN

Twenty-one engineers are enrolled in the graduate Traffic Engineering course at Yale University which began September 23. Fourteen of these men are veterans of World War II. The course will require nine months in residence at Yale University.

For the first time engineers will be trained at the Bureau for the state highway department of New Jersey, Mississippi and New Mexico, the city of Seattle and the National Park and Planning Commission.

Ten of the twenty-one men come from state highway agencies, two from city agencies, two from federal government, and two from consulting or private engineering firms. Four are just out of the Armed Forces and one is from the Army Transportation Corps.

The Committee on Transportation of Yale University awarded ten Automotive Safety Foundation Fellowships to the following men:

Webb J. Crecink, Division of Highway Planning, Mississippi Highway Dept.

George A. Hill, Assistant Highway Engineer, California Highway Dept.

J. L. Holley, Jr., Recently discharged, U.S. Army Ground Forces

John H. Hulse, Resident Highway Engineer, New Jersey Highway Dept.

A. L. Hutchison, Assistant Highway Engineer, California Highway Dept.

Emrys E. Lewarch, Jr., Engineer, Traffic Engineering Div., City of Seattle

Robert E. Schmidt, Sr. Engineering Aid, New York State Dept. of Public Works

Richard I. Strickland, Planning and Traffic Div., Michigan State Highway Dept.

Arthur M. White, Asst. Engineer of Maintenance, Mississippi Highway Dept.

James R. Wichman, Road Design Division, Michigan State Highway Dept.

Two men were awarded Tuition Scholarships made available through Yale University. They are:

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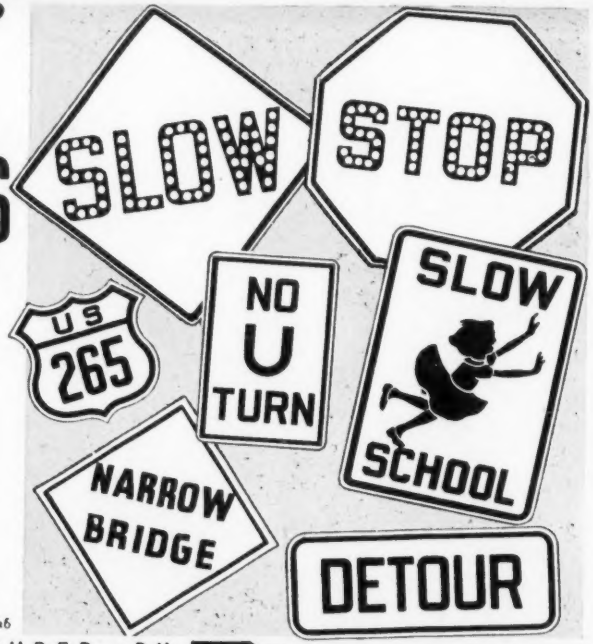


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Captain Edwin L. Mills has been assigned by the Transportation Corps, U.S. Army, for the full year's study.

Other men enrolled for the course are:

Roger T. Chandler, Planning Division, Maryland National Park and Planning Com.

David F. Dabney, New Mexico State Highway Dept.

Edward F. Engle, Recently discharged, U.S. Naval Reserve

Earl H. Flynn, Sr., Engineering Aid, Connecticut Highway Dept.

Jerome D. Franklin, Andrews & Clark, Consulting Engineers, New York City

H. Dean Fravel, U.S. Public Roads Administration, New Mexico

Edwin C. M. Lee, Assoc. Civil Engineer, Honolulu City Planning Commission

Stanley T. Siegel, Recently discharged, U.S. Navy Civil Engineer Corps

## Spencer Miller Proposes Jersey Free-ways

There is more congestion on the highways of New Jersey than in any other State, and 75% of it is concentrated along a 21-mile stretch of Route 25 (U.S. 1) between Woodbridge and the Hudson River tunnels, according to statements contained in an address presented by Spencer Miller, Jr., Commissioner, New Jersey State Highway Department, to the New Jersey Chamber of Commerce. He said that a study of the problem establishes the necessity of building Route 100 as a freeway to run from the George Washington Bridge to the Raritan River at or west of Perth Amboy; the initial investment in the construction would be about $50,000,000. This route would be constructed on a right-of-way of not less than 300 feet, sufficient to accommodate eight lanes of fast-moving traffic. The freeway would provide essential traffic relief, and in addition to reducing the serious economic loss as a result of congestion, it would open up new areas for industrial sites. Further improvement of Route 25 is planned so that it will adequately handle the remaining traffic on that route. An arterial parkway for non-commercial vehicles, from the Hudson River at Fort Lee, with Cape May as one terminus and Trenton as the second, would provide an adequate system of parkways, integrated within the highway system.

Miller stated that an over-all expenditure of about $30,000,000 a year for the next five years would be required for the complete construction of Route 100, or a major portion of it, and for the foundation of a great parkway system.

## Court Upholds Hiring City Consultants

The California Supreme Court recently upheld the right of San Francisco to engage outside consultants to do engineering work, the International City Managers' Association reports.

The court held that the city is not required to have all its engineering work done by civil service employees, and that it can enter into contracts with specialists without calling for bids.

## Parking Meters Require Kentucky State Approval

Plans for installation of parking meters on city streets being maintained by the Kentucky state highway department as part of the state systems must first be submitted to the depart-

ment for approval, announces T. H. Cutler, chief engineer. Some municipalities have not observed state parking regulations, and this ruling is necessary according to Mr. Cutler in the interest of good state-wide traffic regulation. Where municipalities fail to comply with a department request for correcting a parking or meter situation, it can be considered a violation of the state maintenance contract and cause for discontinuing state maintenance of the route.—*Roads and Streets Magazine.*

## PROVIDENCE CHAMBER OF COMMERCE VIEWS ON PARKING METERS

The 1946 issue of the Municipal Yearbook, which is just off the press, contains a very thorough study of the 491 cities in the United States which had parking meters in operation as of February, 1946. Among the cities in the same population class with Providence (250,000 to 500,000), the report shows that there are 14 cities which have parking metters. The total number of meters in operation in these cities is 24,813. They range in number from 997 in Kansas City to a high of 3171 in Houston, Texas. The average number of meters in operation for the 14 cities is 1772. *It is interesting to note that Providence owns 1243 meters. 1170 of these were at one time installed and in operation in the City.* If the question of parking meters is submitted to the voters this Fall and if the meters are re-installed, it is believed that the meters now on hand will be sufficient to take care of the areas formerly served. However, if business establishments on the streets not in the immediate downtown area or congested area feel the need for and request parking meters, it may be necessary to purchase some additional machines.

Since parking meters were first installed in the United States in 1935 the number of cities using them ranged from 6 in 1935 to 347 in 1942, with a peak of 491 in February, 1946. The Municipal Yearbook reports that there *are 22 additional cities which are planning the installation of parking meters during 1946*, which will run the total at the end of the year to well over 500.

*Nearly 61 per cent of the cities in the Providence population class now have parking meters in operation.* There is only one other group of cities with a larger percentage and this is the group just below that of Providence, the 100,000 - 250,000 group which has 69.1 of the cities using parking meters. Much concern is given in most cities as to what is done with the money that is collected through the meters. The Yearbook report shows that—

> "Of the 277 cities over 10,000 reporting on the disposition of parking meter revenues, 225 cities, or 81 per cent, credit the money to the general fund; 39 cities, or 14 per cent, use meter revenues *for traffic improvements;* 7 cities, or 3 per cent, use such revenues *for providing off-street parking facilities;* and the six remaining cities, or 2 per cent, report that part went to the general fund and part for traffic improvements."

By contrast there are only 4 of the 14 cities in the Providence population class which devote the money exclusively for traffic purposes. The balance place the revenue in the general fund.

The merits of parking meters have

been discussed pro and con throughout the width and breadth of the nation. Since, in most cities, only a very small percentage of the total cars parked are parked at the curb, the installation of parking meters cannot possibly be the entire answer to the parking problem. However, if there are 1200 parking spaces in the downtown Providence area which might be controlled by the use of parking meters, there is a good possibility that the number of motorists served during the shopping hours would be doubled or tripled or perhaps quadrupled. Surveys in other cities have shown that in most cases the number of cars parked during a shopping day more than doubled after the installation of parking meters. One Ohio city reports that on the day before parking meters were installed, 4800 cars were parked on the streets. After installation, the number varied from 8500 to 15,000. *Dallas, Texas claimed that 4 times as many cars found parking after meter installation and Wilmington, Delaware claimed available curb space was tripled.*

Until off-street parking areas can be made available and other measures taken to provide parking for the shopping public, the installation of parking meters appears to be one of the important emergency steps which can and should be taken. The Civic Planning and Traffic Board is on record, however, *in favor of using the revenue derived from parking meters for the purpose of traffic regulation and for financing off-street parking facilities.—Reprinted from Highway Research Abstracts.*

## NEW LAWS TO AID BOSTON PARKING PROBLEM

"Greater Boston Needs Action," headlined a recent printed bulletin widely distributed in the Hub City by the Greater Boston Development Committee, and it got action. The state legislature has passed and the governor has signed enabling legislation which will enable Boston to make an all-out attack on the parking problem.

One measure permits the city to borrow $5,000,000 outside its debt limit to acquire sites and construct off-street parking lots or garages for operation by the highest private enterprise bidders. Maximum parking fees will be determined by the city. Another bill authorizes the city to permit private operators to construct and operate a parking garage under Boston Common. Public funds would not be involved in this enterprise.

In urging those far-reaching steps the Greater Boston Development Committee declared, "Boston is recognized as one of the worst traffic snarls in the country. Nearly half of the present street areas are blocked off by parked cars." Altogether the Committee reported, Boston needs 6,700 off-street parking accommodations to adequately serve the six areas known as the retail, financial market, government, shoe and clothing, and electrical and wool districts.

The parking program will serve those areas and will be integrated with the projected express highway known as Central Artery which will cut directly through or near most of the principal traffic destinations. The Central Artery is expected to relieve existing streets of more than 50,000 vehicles daily. That modern non-stop highway plus the planned adjacent parking facilities would entirely eliminate large volumes of traffic and parked cars now cluttering downtown streets.—*Roads and Streets Magazine.*

## BIG CONTRACT AWARDED FOR BAYSHORE FREEWAY

What is said to be the largest single highway construction contract in California history was awarded recently when C. H. Purcell, director of public works, announced the $2,993,000 joint bid of Morrison-Knudsen Construction Co. and Macco Construction Co. for 5.1 miles of the San Francisco Bayshore freeway had been accepted.

The 6-lane highway will be composed of two roadbeds 53 ft. wide and separated by a division strip of from 20 to 26 ft. The work includes necessary approach ramps, acceleration and deceleration lanes and outer highways. All interchange structures will be built under separate contracts.

The new project will be located three-quarters of a mile west of the present highway to allow for expansion of the San Francisco airport. For the relocation the city will spend $1,250,000 from the $20,000,000 voted for airport improvement a year ago.—*Engineering News Record.*

## CITY PLANS PARKING AUTHORITY

A parking authority to buy and develop parking lots for the city is being devised for White Plains, New York, and bears study by other traffic-clogged cities according to the American Public Works Association.

Creation of the authority requires state legislation. Under current plans the authority would be made up of five persons appointed by the mayor and would issue bonds to meet expenses. The proposed group would take over development of a newly-devised cordon of metered parking lots around the central business district and would provide for new bus terminal facilities to reduce traffic congestion.

White Plains' parking problems are increased by the prospect of having United Nations headquarters nearby plus recent opening of branches of several big New York stores. Old parking spaces have been reduced to permit broadened thoroughfares and building construction.

Off-street metered parking in a ring of parking lots near the business district, tried last winter experimentally, is believed by city officials to be the answer to many of White Plains' parking problems. In addition to easing the basic parking dilemma, the method compels residents of other communities to contribute parking fees to help defray street and parking maintenance costs.

Miami Beach, Florida, residents and visitors also feed coins to meters in city-operated parking lots. The Florida resort city adopted this system as a means of doing away with parking lot attendants and thus allowing parking maintenance expenses to vary automatically with seasonal population changes.

An authority similar to that proposed for White Plains now operates the 1,700-car parking garage beneath San Francisco's Union Square. The subterranean unit involved establishment of a special corporation by city charter amendment. No state action was necessary because of the city's "home rule" powers granted by the California constitution.

Washington, D.C., has a parking authority like that sought for White Plains, set up under federal law since the District of Columbia is under congressional jurisdiction. In Missouri, legislation adopted several years ago to provide for a parking authority in Kansas City was declared unconstitutional.

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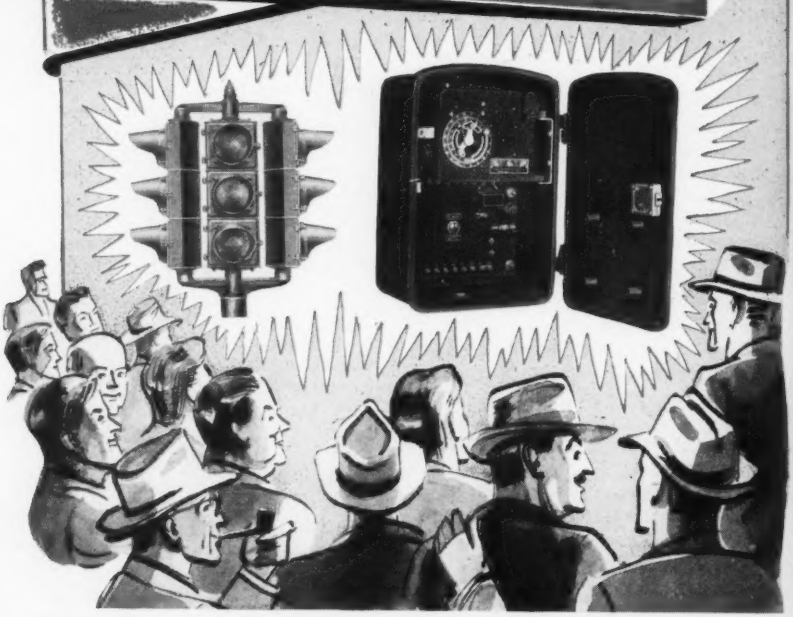

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